WHAT IS CLAIMED IS:

1. An optical waveguide comprising:

a stress-luminescent material provided in at least part of said optical waveguide;

wherein light emitted from said stress-luminescent material is waveguided in said optical waveguide.

2. An optical waveguide according to claim 1, wherein said stress-luminescent material is provided on a side surface of said optical waveguide.

3. An optical waveguide according to claim 1, wherein said optical waveguide comprises an optical fiber, and said stress-luminescent material is provided in a clad of said optical fiber.

4. An optical waveguide apparatus comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said optical waveguide apparatus;

wherein said intersection portion has a stress-luminescent material.

5. An optical waveguide apparatus according to claim 4, wherein a light receiving device is connected to

an end face of at least one of said first optical waveguide and said second waveguide.

6. An optomechanical apparatus comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said optomechanical apparatus;

wherein said intersection portion has a stress-luminescent material.

7. An optomechanical apparatus according to claim 6, wherein a light receiving device is connected to an end face of at least one of said first optical waveguide and said second waveguide.

8. A detecting apparatus comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said detecting apparatus;

wherein said intersection portion has a stress-luminescent material.

9. A detecting apparatus according to claim 8, wherein a light receiving device is connected to an end face of at least one of said first optical waveguide and said second waveguide.

10. An information processing apparatus comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said information processing apparatus;

wherein said intersection portion has a stress-luminescent material.

11. An information processing apparatus according to claim 10, wherein a light receiving device is connected to an end face of at least one of said first optical waveguide and said second waveguide.

12. An input apparatus comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide being provided in at least part of said input apparatus;

wherein said intersection portion has a stress-luminescent material.

13. An input apparatus according to claim 12, wherein a light receiving device is connected to an end face of at least one of said first optical waveguide and said second waveguide.

14. A key-input apparatus comprising:

a plurality of first optical waveguides and a plurality of second optical waveguides disposed so as to intersect each other and coupled to each other at said intersection portions;

wherein each of said intersection portions has a stress-luminescent material.

15. A key-input apparatus according to claim 14, wherein a light receiving device is connected to one end face of each of said plurality of first optical waveguides and a light receiving device is connected to one end face of each of said plurality of second optical waveguides.

16. A fiber structure comprising:

a first optical waveguide and a second optical waveguide disposed so as to intersect each other and coupled to each other at said intersection portion, said first optical waveguide and said second optical waveguide

being provided in at least part of said fiber structure;

wherein said intersection portion has a stress luminescent material.

17. A fiber structure according to claim 16, wherein a light receiving device is connected to an end face of at least one of said first optical waveguide and said second waveguide.

18. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence depending on a time rate of change of stress.

19. An optical waveguide according to claim 1, wherein a luminous intensity of said stress-luminescent material is changed depending on a time rate of change of stress.

20. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence depending on a speed of applying an external force to said material or a speed of releasing the external force.

21. An optical waveguide according to claim 1, wherein a luminous intensity of said stress-luminescent material is changed depending on a speed of applying an external force to said material or a speed of releasing the external force.

22. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence when a finger is touched to said stress-luminescent material.

23. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence when elastic vibration is applied to said material.

24. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence when sound waves are applied to said material.

25. An optical waveguide according to claim 1, wherein said stress-luminescent material emits luminescence when ultrasonic waves are applied to said material.

26. An optical waveguide comprising:

an optical waveguide body; and

a stress-luminescent element provided in at least part of said optical waveguide body;

wherein said stress-luminescent element is made from a stress-luminescent material, and light emitted from said stress-luminescent element is waveguided in said optical waveguide body.

27. An optical waveguide according to claim 26, wherein said stress-luminescent element is provided on a side surface of said optical waveguide body.

28. An optical waveguide according to claim 26, wherein said optical waveguide body is an optical fiber, and said stress-luminescent element is provided in a clad of said optical fiber.

29. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence depending on a time rate of change of stress.

30. An optical waveguide according to claim 26, wherein a luminous intensity of said stress-luminescent element is changed depending on a time rate of change of stress.

31. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence depending on a speed of applying an external force to said element or a speed of releasing the external force.

32. An optical waveguide according to claim 26, wherein a luminous intensity of said stress-luminescent element is changed depending on a speed of applying an external force to said element or a speed of releasing the external force.

33. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence when a finger is touched to said stress-luminescent element.

34. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence when elastic vibration is applied to said element.

35. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence when sound waves are applied to said element.

36. An optical waveguide according to claim 26, wherein said stress-luminescent element emits luminescence when ultrasonic waves are applied to said element.

37. An optical waveguide according to claim 26, wherein said stress-luminescent material comprises an oxide containing one of aluminum, gallium, and zinc as a constituting element.

38. An optical waveguide according to 26, wherein said stress-luminescent material comprises an oxide of an alkali earth metal and aluminum, said oxide being doped with a rare earth element.

39. An optical waveguide according to 36, wherein

said oxide is doped with only one kind of rare earth element.

40. An optical waveguide according to claim 26, wherein said stress-luminescent material is doped with manganese and/or titanium.

41. An optical waveguide according to claim 26, wherein said stress-luminescent material is $SrAl_2O_4$:Eu.

42. An optical waveguide according to claim 26, wherein said stress-luminescent element has a sheet-like shape having a thickness of 1 mm or less.

43. An optical waveguide according to claim 26, wherein said stress-luminescent material has a shape selected from a sponge shape and a framework shape.

44. An optical waveguide according to claim 26, wherein said stress-luminescent material contains one of aluminum, gallium, and zinc as a constituting element.

45. An optical waveguide according to claim 26, wherein said stress-luminescent material contains aluminum and silicon as constituting elements.

46. An optical waveguide according to claim 26, wherein said stress-luminescent material is in the form of fine particles each having a diameter of 100 mm or less.

47. An optical waveguide according to claim 26,

wherein said stress-luminescent material is crystalline.

48. An optical waveguide according to claim 26, wherein said stress-luminescent material is in the form of gel as a whole.

49. An optical waveguide according to claim 26, wherein said stress-luminescent material is a composite material of a fluorescent material and an additional material.

50. An optical waveguide according to claim 49, wherein said additional material is an elastic material,

51. An optical waveguide according to claim 49, wherein the content of said fluorescent material is in a range of 30 wt% or more and less than 100 wt%.

52. An optical waveguide according to claim 50, wherein said elastic material is an organic material.

53. An optical waveguide according to claim 50, wherein said elastic material has a Young's modulus of 10 MPa or more.

54. An optical waveguide according to claim 50, wherein said elastic material is at least one kind selected from a group consisting of polymethyl methacrylate, ABS resin, polycarbonate, polystyrene, polyethylene, polypropylene, polyacetal, urethane resin, polyester, epoxy resin, silicone resin, an organic

silicon compound having a siloxane bond, and an organic piezoelectric material.

55. An optical waveguide according to claim 50, wherein said elastic material is inorganic glass.

56. An optical waveguide according to claim 49, wherein said fluorescent material comprises an oxide containing one of aluminum, gallium, and zinc as a constituting element.

57. An optical waveguide according to claim 49, wherein said fluorescent material comprises an oxide of an alkali earth metal and aluminum, said oxide being doped with a rare earth element.

58. An optical waveguide according to claim 57, wherein said oxide is doped with only one kind of rare earth element.

59. An optical waveguide according to claim 49, wherein said fluorescent material is doped with manganese and/or titanium.

60. An optical waveguide according to claim 49, wherein said florescent material is $SrAl_2O_4$:Eu, and said elastic material is selected from polyester, acrylic resin, and a mixture thereof.

61. An optical waveguide according to claim 49, wherein said fluorescent material has a shape selected

from a sponge shape and a framework shape.

62. An optical waveguide according to claim 49, wherein said fluorescent material contains one of aluminum, gallium, and zinc as a constituting element.

63. An optical waveguide according to claim 49, wherein said fluorescent material contains aluminum and silicon as constituting elements.

64. An optical waveguide according to claim 49, wherein said fluorescent material is in the form of fine particles each having a diameter of 100 mm or less.

65. An optical waveguide according to claim 49, wherein said fluorescent material is crystalline.

66. An optical waveguide according to claim 50, wherein said fluorescent material is crystalline and said elastic material is amorphous.

67. A stress-luminescent composite material sheet having a thickness of less than 1mm, containing a $SrAl_2O_4$:Eu powder as a stress-luminescent material and a polyester resin, wherein the content of said stress-luminescent material is in a range of 30 wt% or more and less than 100 wt%.

68. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence depending on

a time rate of change of stress.

69. A stress-luminescent composite material sheet according to claim 67, wherein a luminous intensity of said stress-luminescent composite material sheet is changed depending on a time rate of change of stress.

70. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence depending on a speed of applying an external force to said sheet or a speed of releasing the external force.

71. A stress-luminescent composite material sheet according to claim 67, wherein a luminous intensity of said stress-luminescent composite material sheet is changed depending on a speed of applying an external force to said sheet or a speed of releasing the external force.

72. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence when a finger is touched to said sheet.

73. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence when elastic vibration is applied to said sheet.

74. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence when sound waves are applied to said sheet.

75. A stress-luminescent composite material sheet according to claim 67, wherein said stress-luminescent composite material sheet emits luminescence when ultrasonic waves are applied to said sheet.